AMENDMENTS

In the Claims:

Amend claims 1-29 to read as follows:

1. (Amended) Exercise equipment, comprising:

a work load device providing a variable work load;

a physiological signal measurement unit for noninvasively measuring a physiological signal during an exercise involving said work load device; and

a load variation rate decision unit driven by the physiological signal obtained during the exercise that determines a load variation rate of an incremental or decremental load and changes a work load at said load variation rate.

2. (Amended) The exercise equipment of claim 1, wherein said physiological signal is an electrocardiographical signal or a pulsation signal.

3. (Amended) The exercise equipment of claim 1, wherein said physiological signal is a heart rate variability signal obtained from an electrocardiographical signal.

4. (Amended) The exercise equipment of claim 3, wherein said heart rate variability signal is a heart rate variability power signal.

5. (Amended) The exercise equipment of claim 3, wherein said heart rate variability signal indicates entropy of heart rate variability.

6. (Amended) The exercise equipment of claim 1, wherein said physiological signal is a signal indicating a power spectrum of heart rate variability.

7. (Amended) The exercise equipment of claim 1, wherein said physiological signal comprises a heart rate signal obtained from an electrocardiographical signal and a pulse count signal obtained from a pulsation signal, and a heart rate variability signal is obtained from the electrocardiographical signal.

8. (Amended) The exercise equipment of claim 7, wherein said heart rate variability signal is a heart rate variability power signal.

9. (Amended) The exercise equipment of claim 7, wherein said heart rate variability signal indicates entropy of heart rate variability.

10. (Amended) The exercise equipment of claim 1, wherein said physiological signal comprises a heart rate signal obtained from an electrocardiographical signal, a pulse count signal obtained from a pulsation signal and a signal denoting a power spectrum of heart rate variability.

11. (Amended) An apparatus estimating a physical fitness level, comprising:

a physiological signal measurement unit noninvasively measuring a physiological signal during an exercise;

a load variation rate decision means unit driven by said physiological signal obtained during the exercise that determines a load variation rate of an incremental or decremental load; and

a physical fitness level estimation unit estimating a physical fitness level from a relationship at said determined load variation rate between a work load and a heart rate during an exercise.

12. (Amended) An apparatus determining an exercise intensity, comprising:

a physiological signal measurement unit noninvasively measuring a physiological signal during an exercise;

a load variation rate decision unit driven by a physiological signal obtained during the exercise that determines a load variation rate of an incremental or decremental load; and

an exercise intensity decision unit determining an optimal exercise intensity at said determined load variation rate from a relationship between a work load and a heart rate variability during an exercise.

13. (Amended) The apparatus of claim 12, wherein said heart rate variability indicates a heart rate variability power.

14. (Amended) The apparatus of claim 12, wherein said heart rate variability indicates entropy of heart rate variability.

15. (Amended) An apparatus determining an exercise intensity, comprising:

a physiological signal measurement unit noninvasively measuring a physiological signal during an exercise;

a load variation rate decision unit driven by a physiological signal obtained during the exercise that determines a load variation rate of an incremental or decremental load; and

an exercise intensity decision unit determining an optimal exercise intensity at said determined load variation rate from a relationship between a work load and power spectrum of heart rate variability during the exercise.

16. (Amended) The exercise equipment of claim 11, further comprising a work load device providing a variable work load,

wherein said work load device changes a work load to reflect a physical fitness level obtained from the physical fitness level estimation unit or an exercise intensity obtained from the exercise intensity decision unit.

17. (Amended) A method of determining an exercise intensity, comprising:

providing exercise equipment having a storage unit having stored therein a plurality of physiological-signal variation patterns obtained during an exercise against a load,

noninvasively measuring a physiological signal during the exercise,

determining a physiological-signal variation pattern by matching a pattern of variation of said measured physiological signal with said stored physiological-signal variation patterns, and

determining an appropriate exercise intensity based on the determined pattern.

18. (Amended) The method of claim 17, wherein said variation pattern is determined during a predetermined time interval associated with a work load increasing or from a physiological signal variation rate for each work load value interval.

19. (Amended) The method of claim 17, wherein said physiological signal is an electrocardiographical signal or a pulsation signal.

20. (Amended) The method of claim 17, wherein said physiological signal is a heart rate variability signal obtained from an electrocardiographical signal.

21. (Amended) The method of claim 20, wherein said heart rate variability signal indicates heart rate variability power.

22. The method of claim 17, further comprising determining said appropriate exercise intensity corresponding to said determined pattern by an operation corresponding to said determined pattern.

23. (Amended) Exercise equipment, comprising:

a load device providing a variable load,

a storage unit having stored therein a plurality of physiological-signal variation patterns obtained during an exercise against a load,

a physiological signal measuring unit measuring a physiological signal invasively over time,

a decision unit determining a physiological-signal variation pattern by matching a pattern of variation of said measured physiological signal with said stored physiological-signal variation patterns, and

an exercise intensity determination unit determining an appropriate exercise intensity based on said determined pattern, wherein said load device provides a load set to correspond to said exercise intensity determined by said exercise intensity determination unit.

24. (Amended) Exercise equipment, comprising:

a load device providing a variable load,

a storage unit having stored therein a plurality of physiological-signal variation patterns obtained during an exercise against a load,

a physiological signal measuring unit measuring a physiological signal invasively over time,

a decision unit determining a physiological-signal variation pattern by matching a pattern of variation of said measured physiological signal with said stored physiological-signal variation patterns, and

a physical condition determination unit determining a physical condition from said determined pattern.

25. (Amended) The exercise equipment of claim 23, wherein said physiological signal is a heart rate variability signal obtained from an electrocardiographical signal.

26. (Amended) An apparatus providing assistance in determining a physical condition, comprising:

a storage unit having stored therein a plurality of physiological-signal variation patterns obtained during an exercise against a load,

a physiological signal measuring unit measuring a physiological signal invasively over time,

a variation pattern determination unit determining a physiological-signal variation pattern by matching a pattern of variation of said measured physiological signal with said stored physiological-signal variation patterns, and

an output unit outputting said determined pattern.

27. (Amended) The apparatus of claim 26, wherein said physiological signal is a heart rate variability signal obtained from an electrocardiographical signal.

28. (Amended) A measurement apparatus, comprising:

a storage unit having stored therein a plurality of physiological-signal variation patterns obtained during an exercise against a load,

a physiological signal measuring unit measuring a physiological signal invasively over time,

a decision unit determining a physiological-signal variation pattern by matching a pattern of variation of said measured physiological signal with said stored physiological-signal variation patterns,

a physical condition determination unit determining a physical condition from said determined pattern, and

an output unit outputting said determined physical condition.

29. (Amended) The measurement apparatus of claim 28, wherein said physiological signal is a heart rate variability signal obtained from an electrocardiographical signal.

Add new claims 30-36, as follows:

30. The exercise equipment of claim 12, further comprising a work load device providing a variable work load and a physical fitness level estimation unit estimating a physical fitness level from a relationship at said determined load variation rate between a work load and a heart rate during an exercise,

wherein said work load device changes a work load to reflect a physical fitness level obtained from the physical fitness level estimation unit or an exercise intensity obtained from the exercise intensity decision unit.

31. The exercise equipment of claim 15, further comprising a work load device providing a variable work load and a physical fitness level estimation unit estimating a physical fitness level from a relationship at said determined load variation rate between a work load and a heart rate during an exercise,

wherein said work load device changes a work load to reflect a physical fitness level obtained from the physical fitness level estimation unit or an exercise intensity obtained from the exercise intensity decision unit.

32. The method of claim 18, further comprising determining said appropriate exercise intensity corresponding to said determined pattern by an operation corresponding to said determined pattern.

33. The method of claim 19, further comprising determining said appropriate exercise intensity corresponding to said determined pattern by an operation corresponding to said determined pattern.

34. The method of claim 20, further comprising determining said appropriate exercise intensity corresponding to said determined pattern by an operation corresponding to said determined pattern.

35. The exercise equipment of claim 23, wherein said physiological signal is a heart rate variability signal obtained from an electrocardiographical signal.

36. The exercise equipment of claim 24, wherein said physiological signal is a heart rate variability signal obtained from an electrocardiographical signal.